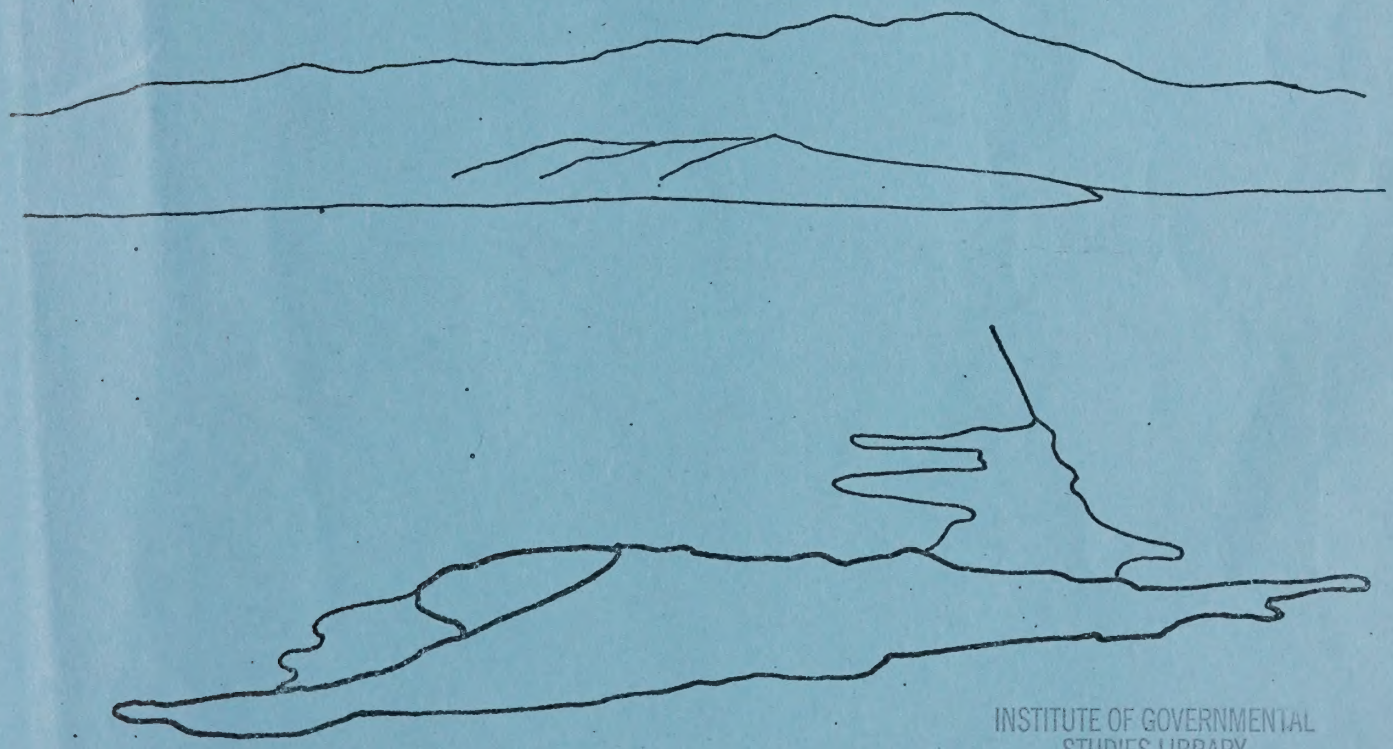
BROOKS ISLAND REGIONAL SHORELINE

Jan. 1976



Resource Analysis

RESOURCE INVENTORY

and

ANALYSIS

for

BROOKS ISLAND REGIONAL SHORELINE

Planning and Design Department
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January 1976

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FOREWORD

Since Brooks Island was acquired by the East Bay Regional Park District in 1968, a number of development proposals have come forward, and many other ideas considered. The Island has sparked the imagination of many people, but the Island's situation, which requires very high maintenance and operations expense, has generally rendered most of these proposals infeasible. In the interim, the Island has been leased to a licensed pheasant hunting club for an annual rental and caretaker service.

The wide interest in the Island--it arouses everyone's curiosity and has been the subject of extensive scientific research--has provided an opportunity for and intensive resource study. Experts in many fields have been consulted about the natural resources of the Island and what, if any, special protective measures are needed to protect these resources and allow compatible public use of the Island. The author's appreciation is expressed to Dr. William Lidicker, professor of zoology; Dr. Arnold Schultz, professor of forestry and conservation; Dr. Lawrence Heckard, curator of the Jepson Herbarium (all of the University of California at Berkeley); Mr. George Coles, instructor of anthropology at Contra Costa College in San Pablo; his wife and assistant, Corrine; and also to Mr. Ross Wagner, staff geologist with the Geotechnical and Materials Engineering Office of the United States Forest Service; Mr. Fred McCollum, graduate student in zoology at UC Berkeley; Mr. George Collier of Albany, local historian; and Mr. Wayne Roberson of San Pablo, local representative of the American Indian movement.

The aforementioned have provided extremely valuable information regarding various aspects of the Island's history, prehistory, cultural concerns, flora fauna, and other natural resources. A good deal of staff work and assistance, particularly from Mr. Harry Reeves and Mr. Ron Russo, also aided the author's efforts greatly. Finally, the Sheep Island Gun Club itself has been very cooperative in the course of this study; the club and its Island care taker, Mr. Al Bettencourt, are thanked for their assistance in providing information about the Island and in providing transportation to and from the island. The study has been a thorough (though by no means exhaustive) and enjoyable work experience for the author and for all involved.

It is hoped that this report will serve as the basis for sound planning of the island, providing an informational base to balance the needs of the public and the protection of one of the East Bay's most interesting and unique parklands.

I. INTRODUCTION

Intent of Report

The recently adopted Master Plan for the East Bay Regional Park District establishes the Parkland Planning Policy to guide development of both new acquisitions and existing parklands. For existing parks the first step in this procedure is the preparation of the Resource Analysis.

> *"Resource Analysis: After a parkland site has been acquired by the District and prior to the development of a land use plan, the District will complete a resource analysis which will identify features of the parkland which have significant resource value as well as provide a potential plan for vegetative and wildlife management. Where an aquatic element is involved, a water management plan will be included Guidelines will be established to be used in later planning processes to protect significant natural resources which could be adversely affected by parkland use."* *(Master Plan, p.28)*

This report was prepared in response to the above requirement. It is limited to a discussion of the existing resources and the present or possible future impact of development on these resources. Use patterns, recreation potential, existing user problems, and the role of the park in the overall park system will be considered in the Land Use Development Plan.

Description

Brooks Island Regional Shoreline is located in San Francisco Bay, one half mile from the Richmond shore in Contra Costa County. The parkland consists of seventy-seven acres of land and water. The Island itself covers forty-five acres and rises gently to a height of 160 feet. Due to lack of proper access, the parkland has been closed to general use and is available only on a permit basis, with the permittee providing his own transportation to the island. Important features include two Indian shellmound sites, grassland areas dominated largely by native species, a few old buckeyes, and approximately one and one-half miles of shoreline on the bay. A magnificent 360-degree view may be enjoyed from the top of the island. The breakwater area to the west, and one-half acre Bird Island to the southwest are under different ownership.

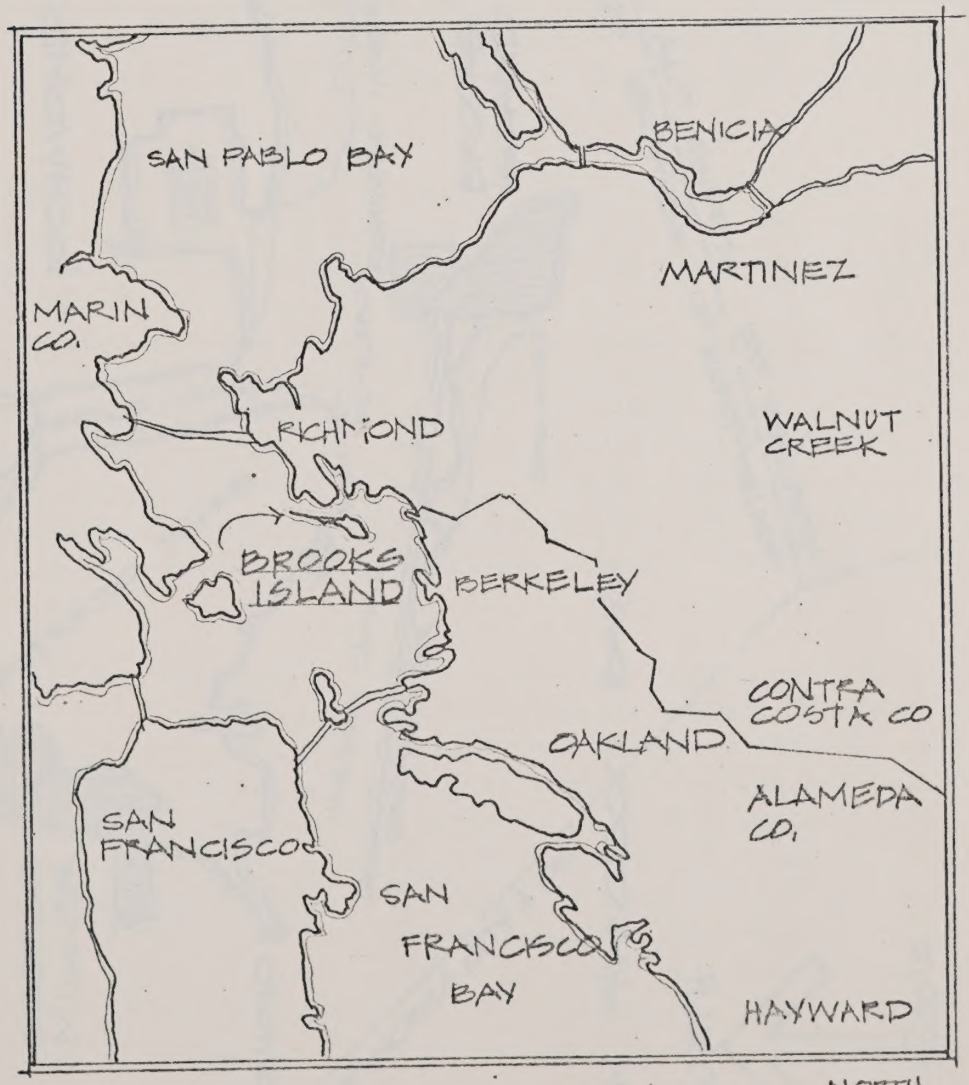


FIGURE 1
LOCATION MAP

NORTH
1" = 5 MI.

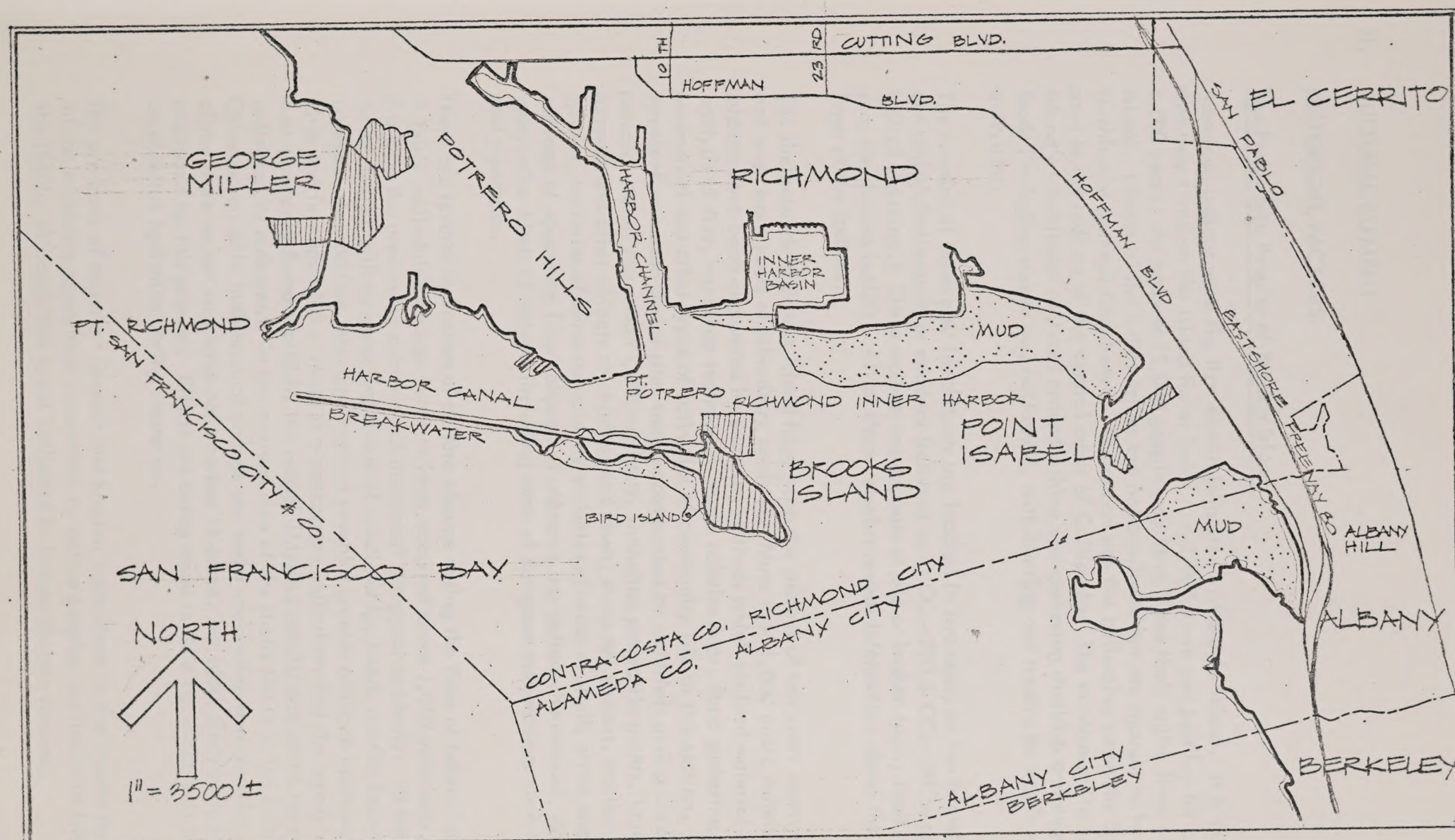


FIGURE 2
AREA MAP

LEGEND

REGIONAL PARK

MUD

II. CULTURAL ELEMENT

HISTORICAL FACTORS

The Prehistoric Peoples of Brook's Island

American Indians were the first known inhabitants of Brooks Island. It is estimated that they lived on the island for at least 2,000 years and possibly for over 3,000 years. As many as 15,000 people may have lived their entire lives on the island. Names of the Indian tribes are not confirmed but are thought to have been Huchium or perhaps Chochenyo. Costanoan was the collective name the Spanish gave to the Indians of the central coast of California. The economic life of the island's inhabitants centered around fishing and gathering shellfish and vegel, foods (including acorns and buckeyes), with hunting and trading as supplementary activities.

The remains of these past inhabitants are located in two areas on the island which are called shellmounds or middens (referred to as CCo-290 & CCo-291 in archiological indexing.) These mounds are deposits of old or broken tools, food remains, etc. and human burials. All of these remains reveal information about the daily lives of the Indians.

The shellmounds of Brooks Island have been the subject of ten years excavation and even more years of laboratory analysis. More than 1,000 cubic meters of midden have been excavated by exacting methods which yielded material for analysis of diet, workshop techniques, trade relationships, food gathering, ceremonial and other types of activities of community life in this setting. The twenty-five human burial sites were accompanied by materials giving clues to personal status; more than 1,000 artifacts, including projectile points, knives, scrapers and other objects of obsidian and chert; stone net sinkers, mortars, pestles, varieties of bone tools; many varieties ofbeads of shell, stone and bone; cordage of apocynum fiber; objects of unknown use called charmstones, and many other kinds of objects including some of European manufacture such as beads and pipestems.

There are several indicators of culture change during the time of habitation. A fairly well-dated change seems to have occurred about 1,000 years ago. At this time the previously common "charmstones" disappear suddenly. At the same time, though with no clear indication of relationship, beads tend to become common. In addition, the food remains reveal a greater reliance upon aquatic birds and less upon fish. There is a concurrent indication that the supply of the most commonly found shellfish, the mussel (Mytilus edulis) was being taxed, as indicated by a decrease in the average size of the shells found in the midden. Other more subtle indicators of change are under continuing investigation. Finds of the more recent eras have been carbon 14 dated, but older finds have proven undatable by this process. Efforts are being made to date the older eras with an obsidian hydration dating sequence.

The presence of apparent Spanish and Russian trade items in the uppoer portions of the midden suggests that occupation by native peoples continued as late as the 1840's, although this is not indicated in known historic records.

The Spaniards

San Francisco Bay was first sighted by Spanish soldiers of the Portola expedition in 1769. In 1772, the first exploration of the East Bay area took place under Pedro Fages. This expedition generally followed the edge of the Berkeley Hills and included observations of the several islands in the bay. The first nautical survey of San Francisco Bay was done in 1775 by Jose de Canizares under Juan Manuel de Ayala, commander of the sloop San Carlos. Canizares made a fairly complete and accurate map of the bay, including a small, rocky island which he named Isla de Carmen. This island is today called Brooks Island.

Among the officers of the Presidio of San Francisco around the turn of the century was Francisco Maria Castro who rose ultimately to become commandant of the Presidio. Don Castro wished to acquire a rancho for his family and on April 15, 1823 he applied formally for a grant of land on the "Contra Costa." He was given immediate possession and enjoyed use of the 19,000 acre property known as Rancho San Pablo, but he died in 1831 (at the age of 56) before legal title was secured. Title was granted by the Mexican authorities in 1834 to Castro's heirs. Whether or not Castro claimed Isla de Carmen as part of Rancho San Pablo has not been confirmed, though it is thought that he did. However, following the Mexican War, the Treaty of Guadalupe-Hidalgo ceded to the US Government all tide and marsh lands and all islands on the coast or within bays regardless of earlier title. Thus, in 1848 Isla de Carmen became part of the public domain.

Origin of Name

The origin of the present name of the island is not known. As early as 1850, charts of the bay showed the island with the name "Brooks" attached to it. This chart is credited to Commander Cadwalder Ringgold, USN, who conducted nautical surveys of several portions of the California coast. In 1853, an offical map of the state was adopted by the State Legislature. The map bore the name "Brooks Island" and although the island is also referred to as Sheep Island, the name "Brooks" has been official since 1853.

Land Use in the American Era

In 1868 an "Act to Survey and Dispose of Certain Salt Marsh and Tide Lands Belonging to the State of California" allowed the State Board of Tide Lands Commissioners to survey, subdivide and sell salt marsh and tidelands to a depth of nine feet at low tide outside of San Francisco but within five miles of the city's boundaries. This area surrounded Brooks Island on two sides but did not include the island itself. The subdiving resulted in the private ownerships which occupy the tidelands today.

According to the Tidelands Subdivision the tidelands were subject to restrictions providing for public right of navigation and commerce because the area was visualized as a major harbor. The US Army Corp of Engineers designated the habor configuration. In the 1920's and 30's the Port of Richmond was constructed. Part

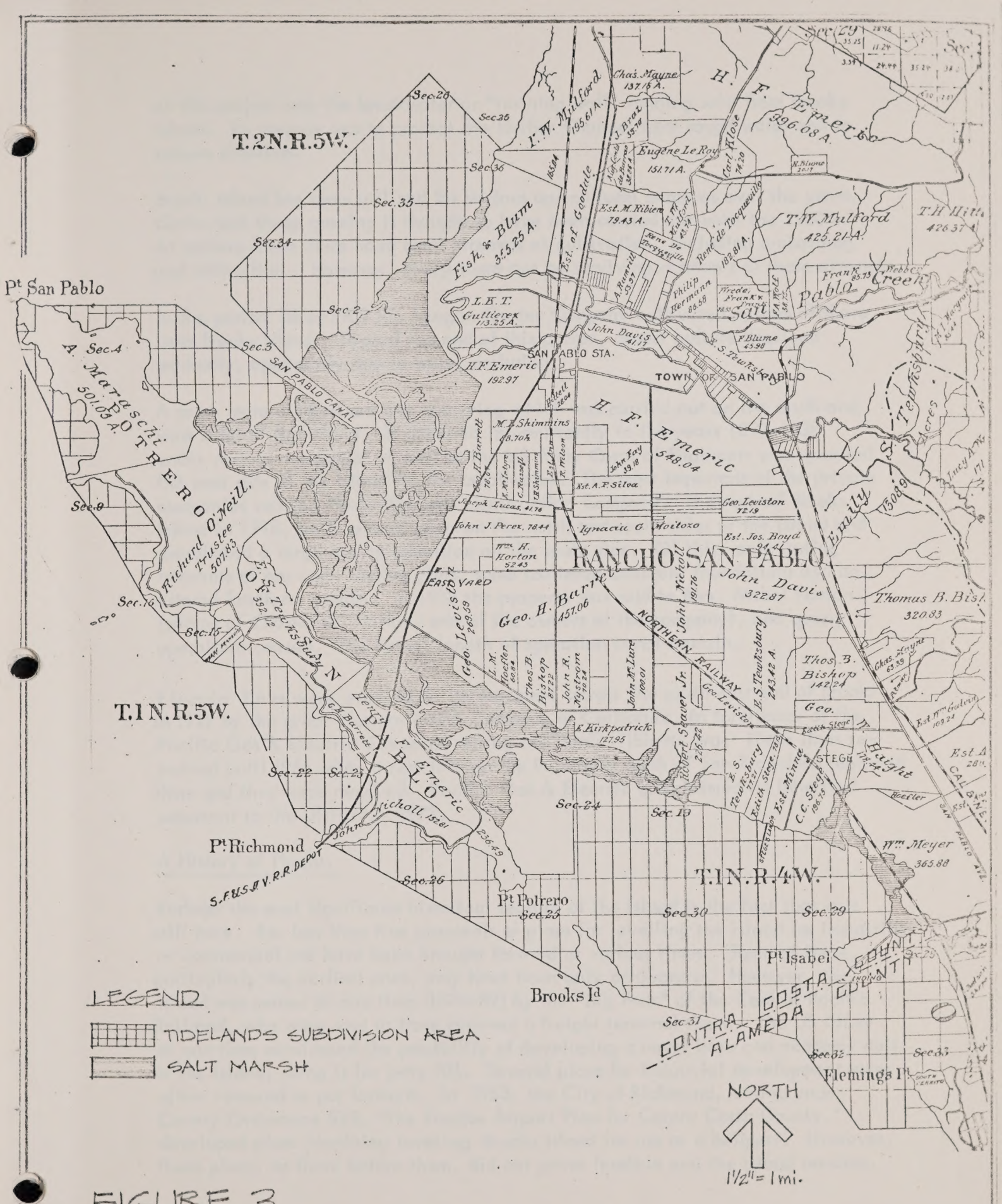


FIGURE 3
TIDELANDS SUBDIVISION OF 1868

of this project was the breakwater or "training wall" running west from Brooks Island. Its purpose was to protect the Harbor Channel from rough water and to reduce siltation.

Brooks Island has been utilized for various agricultural purposes over the years. Cattle and sheep grazing is thought to have been carried out until the 1930's. At various times there have been attempts at cultivation, including orcharding and viticulture. However, today there are no surviving remnants of these attempts.

In the period 1886-1909 the Morgan Oyster Company cultivated oysters offshore from Brooks Island. Toward the end of this period, oyster culture declined markedly, apparently due to water pollution.

A much more evident use was quarrying which was carried out on the south and west sides of the island. It occurred intermittently in the years 1892-1938 under various companies as well at the US Army Corps of Engineers who quarried the west side of the island for the breakwater. The most important of the private companies was the Healy-Tibbetts Construction Company. It acquired Brooks Island in 1918, built several piers on the north and south sides of the island and established a large quarry operation on the south side. Of this, only rusting remnants of ore cars, rotting piers, some scattered concrete foundations and an altered landform remain. In 1938 the property was sold to Mrs. Mabel Horton (widow of Charles C. Horton, one of the owners of the company), and quarry operations ceased. The actual length of operation is not certain.

Electric lines were erected on an easement across the south east end of Brooks in 1922 by the great Western Power Company of California, (a forerunner of the Pacific Gas & Electric Company) during the Healy-Tibbetts era. These lines remained until 1966 when a new line on the Peninsula south of San Francisco replaced them and they were removed. Pacific Gas & Electric quitclaimed its inherited easement to the District in 1972.

A History of Threats

Perhaps the most significant historical feature of the island is the fact that it is still here. No less than five proposals or plans for levelling the island for industrial or commercial use have been brought forward at various times. Some of these, particularly the earliest ones, may have been only conjecture. However, the island was owned at one time (1874-89) by the "Big Four" of the Central Pacific Railroad, who were said to have planned a freight terminal there. The US Navy at one time considered the possibility of developing a naval base and academy east of the island, using it for jetty fill. Several plans for industrial development were either rumored or put forward. In 1953, the City of Richmond, acting under County Ordinance 525, "The Precise Airport Plan for Contra Costa County," developed plans involving leveling Brooks Island for use as a heliport. However, these plans, as those before them, did not prove feasible and the island remains.

A Unique Parkland

The possibility of acquiring the island as a park or marina by Contra Costa County, the State of California, and the City of Richmond, all in the 1950's, were rejected, mainly because the owners had placed such a high value on the island. Later, in 1965, the East Bay Regional Park District began negotiations with the landowners with the intention of incorporating Brooks Island into the two-county park system. Lengthy negotiations resulted in the District's acquiring the island in 1968 out of court for the sum of $625,000, of which $326,373 was refunded to the District from the federal Department of Housing and Urban Development. Since 1968 the island has been leased to the Sheep Island Gun Club pending development of suitable access and park facilities.

LEGAL AGREEMENTS AND RESTRICTIONS AND ZOINING

The water area of Brooks Island is subject to restrictions by the US Army Corps of Engineers regarding public rights of navagation and commerce. (These restrictions date from the 1868 Tidelands Subdivision). San Francisco Bay Development Conservation Commission (BCDC) also has jurisdiction over the water area and a 100' shoreline band.

The island is zoned M-3 Heavy Industrial by the city of Richmond.

The Park District has a lease agreement with the Sheep Island Gun Club who utilize the island for pheasant hunting. The Gun Club leased the island from the previous owners and the Park District maintained the lease, ammending it to allow automatic extensions for successive six-month periods at the termination of the lease. The mobile home now occupied by the caretaker and the floating dock will be transferred to the District. The lease provides a modest income to the District (currently $2,720 per year) and also provides for a caretaker who is an employee of the gun club. The caretaker provides indirect services to the District of security and other functions on the island which the District would otherwise assume. The lease, as originally established in 1965 with subsequent amendments, is still in effect.

The Federal Department of Housing and Urban Development granted the District funds for a portion of the purchase price of Brooks Island. As part of this participation, HUD approval is required prior to any sale or transfer of rights on the property.

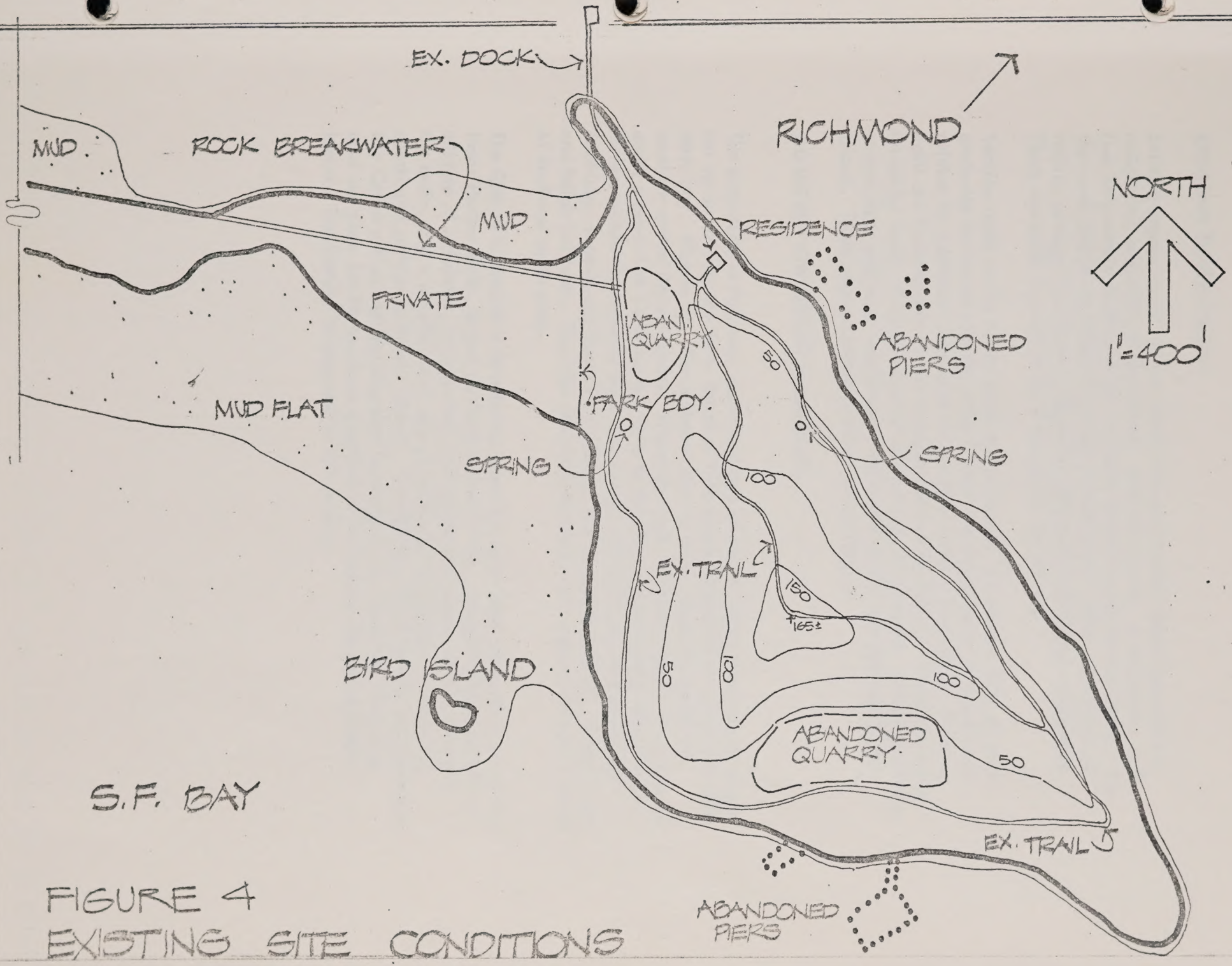


FIGURE 4
EXISTING SITE CONDITIONS

EXISTING DEVELOPMENT

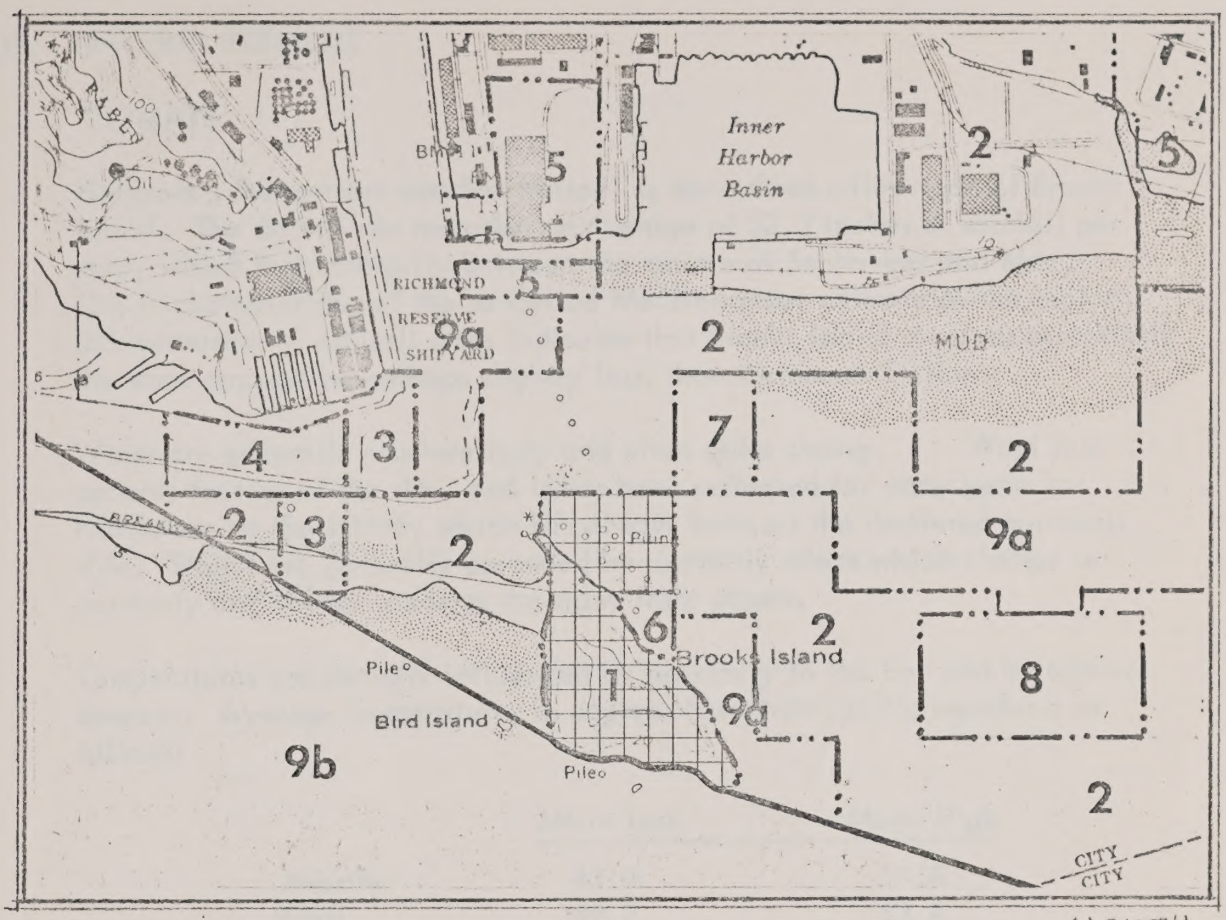
Existing improvements on the island include a mobile home (caretaker's residence), a garage, a dog kennel, and some sheds. A small pier, 250 feet long with a floating dock, provides a landing site for the lessee. On the south end of the island there are several picnic tables and chemical toilets; sewage from these is disposed of by disinfection and composting. There are wells located at the 2 springs on the island.

Service roads on the island total approximately two miles. One of these encircles the island and the other follows the ridgeline to its summit and rejoins the perimeter road near the southeast end of the island. Several trails are found mostly on the northeast side of the island. These are maintained by hand. Certain remnants of the quarrying period, including broken, rusted pipes and some foundations, still exist on the southern end of the island. These may constitute a minor safety hazard.

ADJACENT OWNERSHIP & LANDUSE

The properties to the west, north and east of Brooks Island were among those put up for sale by the State Board of Tide Lands Commissioners under an 1868 state law. (Figure 3). The outboard line of these properties touch the southern end of Brooks Island. Properties south of Brooks Island are governed under a grant (AB 2354) by the State to the City of Richmond. Major landowners within the tideland area near Brooks Island (Figure 4) include the Atchison, Topeka and Santa Fe Railway; the City of Richmond; Helen House and Ralph Sullivan. The Park District's holdings total approximately 77 acres of land and water area.

The City of Richmond is developing plans for major redevelopment around the Inner Harbor Basin, known as Project Area 11-A. Ultimate plans include a mixture of industrial, commercial, and residential areas, with a marina in the basin, and a possible ferry slip providing transportation to other bay points and perhaps to Brooks Island. In addition, the City and San Francisco Bay Conservation and Development Commission are currently reviewing land use plans for the southern coastline of Richmond, including Brooks Island. The District is involved in this review.



NORTH

1" = 2000'

LEGEND

—·—·—	PROPERTY LINE
———	TIDELANDS SUBDIVISION LIMIT
	PROPERTY WITHIN TIDELANDS
1	EAST BAY REGIONAL PARK DISTRICT BROOKS ISLAND
2	ATCHISON, TOPEKA & SANTA FE RAILROAD
3	HELEN HOUSE
4	U. S. A.
5	UNIVERSITY OF CALIFORNIA
6	RALPH SULLIVAN
7	CHARLES & FRANCIS O'NEILE
8	STATE OF CALIFORNIA
9a	CITY OF RICHMOND
	PROPERTY OUTSIDE OF TIDELANDS
9b	CITY OF RICHMOND

FIGURE 5
PROPERTY OWNERSHIP NEAR BROOKS ISLAND

III. NATURAL ELEMENT

CLIMATE

Richmond, the nearest weather station, is some three miles north of Brooks Island. The station has recorded an average of 22.3 inches of rainfall per year, which falls primarily between the months of September and May. This is characteristic of the so-called Mediterranean climate of the region. Interpretation of rainfall maps indicates that Brooks Island receives essentially the same amount (or perhaps slightly less) than Richmond Station.

Winds are generally southwesterly and often quite strong. Wind is a general feature of the site, and it has been reflected for many years in habitation on the island, which has always been on the sheltered northeast side. Storms are generally preceded by southerly winds which change to northerly and colder winds as the storm front passes.

Temperatures are strongly influenced by proximity to the bay and by onshore breezes. Average temperatures in degrees Farenheit for Richmond are as follows:

	Mean Low	Mean High
January	43.0	57.4
April	49.2	63.4
July	54.9	69.0
October	53.2	71.5

Temperatures over 90° or below 32° are uncommon but they do occur at times. The proximity to the bay moderates larger influences. Smog is occasionally a problem at the park as there are no topographical features to prevent it. On bad days eye irritation can result.

TOPOGRAPHY

The topography of Brooks Island is quite simple. The island is roughly triangular with slopes dipping in all directions away from the island's high point of 161 feet. This results in a 360° panorama from the peak. The island's main axis is oriented northwest-southeast, perpendicular to the prevailing winds, and thus the northeast side of the island is protected from the wind. The strongest relief is seen on the south side of the island where the old Healy-Tibbetts quarry has left some extremely steep slopes coming right off the top of the island. The breakwater extending to the west-northeast is some two miles long. Currents acting on the breakwater have created beaches and upland up to ten feet above mean sea level.

VISUAL QUALITY

The topography, location, and undeveloped aspect of Brooks Island have combined to make the vistas from it some of the finest anywhere in the Bay Area. The closest mainland area is the Port of Richmond to the northeast. To the south and southwest, the cities of Oakland and San Francisco appear distant in time as well as in mileage. The Golden Gate and the rugged Marin landscape complete the scene. Sounds are generally muffled by distance.

The visual quality of Books changes with one's proximity to the island. From the mainland the island is a focal point in the large expanse of bay water. The attached breakwater reveals man' work, but the island landscape sharply contrasts the high degree of development of the Richmond mainland. The intervening bay waters create a feeling of remoteness from the activity of the Port of Richmond.

On the island vistas are unobstructed by large vegetation. The topography is revealed and the landscape is a mosaic of yellow grass and green shrubs. The two quarry sites are obvious alterations to the natural landform but the vegetation which has covered them over the years has softened their appearance. Focal points on the island are the shoreline, hilltops and buckeyes.

GEOLOGY AND SOILS

Rock Types:

Brooks Island is comprised of rocks of the Franciscan formation of Jurassic age. This group is somewhat restricted in the East Bay; perhaps Brooks Island and the Potrero Hills are more closely related to Marin County, where this formation is extensive.

At Brooks Island these rocks are mostly greywacke and greenstone, with some sandstone, chert and shale. The rocks form part of a melange unit, an important factor in the island's water supply. Melange refers to a mass of sheared or crushed materials (matrix) in which unsheared fragments are embedded. These materials have differing permeabilities which may determine location of springs. The matrix is of very low permeability; thus the unsheared materials act as reservoirs.

Offshore areas consist of younger bay mud, lying upon the more stable older bay mud. Depths in these materials to bedrock have not been determined.

The San Pablo fault, which is considered inactive, lies one-quarter mile to the east of Brooks Island. This fault borders the entire eastern edge of the Potrero Hills, the range in western Richmond of which Brooks Island is a part.

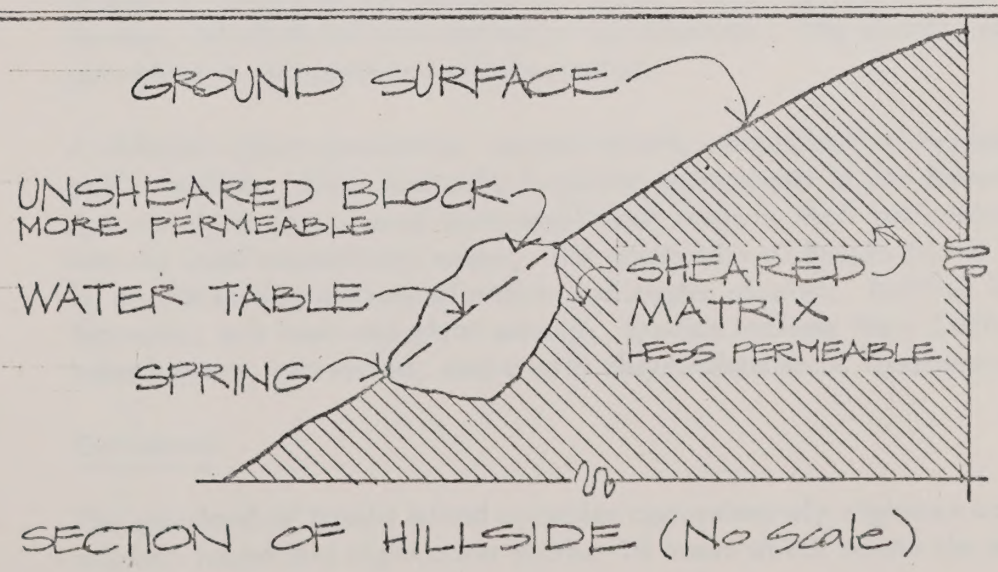
Soils:

The Contra Costa Soil Survey contains information on Brooks Island but it appears to be based on inadequate data. The Survey assigns the soil of the island to a series called Xerorthents in which rock exposures are expected to make up fifty to seventy-five percent of the unit; however, this is not the case at Brooks Island. It is possible that the soils may be part of the Los Gatos (on north slopes) and Millsholm (south and west slopes) series, as is the case with the Potrero San Pablo located northwest of the island. The relationships and capabilities of the soils have not been determined. These would be clarified by further investigation.

HYDROLOGY, TIDAL ACTION AND WATER QUALITY

Brooks Island contains no streams other than small drainage swales which carry storm runoff. Of particular interest on the island are two springs; one on the northeast side of the island and the other on the west side. The western spring carries a small year round flow while the flow from the other stream stops during the summer, although the well retains water. The reason for the springs is found in the island's geology.

The island consists of a melange unit. In general, the melange matrix has an extremely low permeability due to its lack of open fractures and high clay content. Unsheared blocks, on the other hand, commonly have a high fracture permeability. As a result, each fractured, unsheared block may act as an isolated reservoir enclosed in an impermeable sheared matrix. Springs commonly develop at the lowest point of intersection between the land surface and the unsheared block containing the water.



SECTION OF HILLSIDE (No Scale)

FIGURE 6
DIAGRAM OF MELANGE UNIT

At the western spring, water issues from an unsheared greywacke, suggesting that this greywacke block serves as a reservoir for fresh water. The spring on the northeast side of the island is substantially above the level of the bay. A cursory examination gives no clear indication of the origin of the spring. No obvious unsheared blocks are at the spring site, but chert debris is present around the water's margin. At the southern end of the island, the quarrying operation cut deeply into the melange resulting in a seepage area and two ponds.

Although the bay level may fluctuate as much as eight or nine feet at Brooks Island, the range averages about five feet. At lower tides, mud flats extend around the island for hundreds of feet except on the south. Boats with draft greater than twelve feet cannot reach the island at low tides.

Two outfalls of treated municipal sewage and chemical wastes are found along the south Richmond shoreline. These include Richmond Municipal Sewer District (outfall at Ferry Point) and Stauffer Chemical Corporation near south 49th Street. The Stege Sanitary District at Point Isabel has recently connected into the East Bay Municipal Utility District system and no longer discharges into the bay. The treatment plant there serves as a holding area during rainstorms. Water quality and turbidity near the island may be affected by these and other uses of the Richmond shore.

VEGETATION

Salt Marsh and Coastal Strand:

A small area of salt marsh occurs around the northern end of Brooks Island, with more substantial areas westward along the breakwater. The salt marsh is dominated by pickleweed and salt grass. Other species present include jaumea, alkali-heath and statice or sea-lavender. The shrubby salt marsh gum plant is also present on higher points.

A different plant community, coastal strand, occurs behind the beaches in small numbers. This community is poorly represented in San Francisco Bay, due mainly to loss of sand dune and beach areas or their conversion to heavily used recreational areas. The community of Brooks Island is represented by an interesting mixture of native and exotic species. Natives include franseria, salt bush and giant suncup. Exotics include New Zealand spinach, brass buttons, sea rocket, and a wild chrysanthemum of European origin.

Grassland:

The grassland of Brooks Island occupies approximately eighteen acres of the original island and eight acres on the fill areas which bound the southern

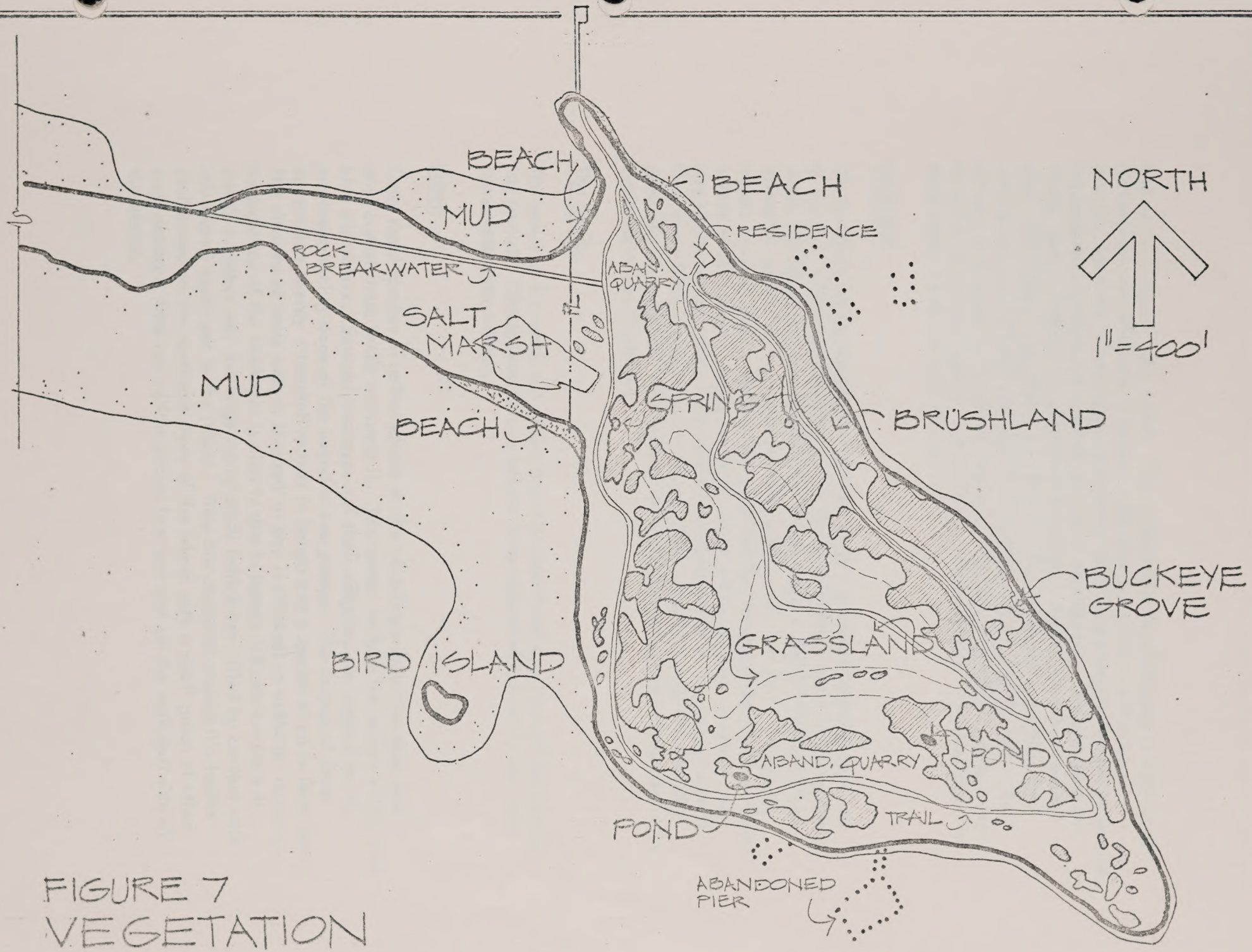


FIGURE 7
VEGETATION

and western edges of the island. The grassland on the fill areas is dominated by European annuals such as barley, wild oats and others. Of primary interest, however, is the island grassland, which is dominated by native species. Foremost among these are needlegrass, rye, and fescues. The grassland includes many wildflowers, such as wild hyacinth, lupine, checker, balsam root, wild violet, soap plant, and others. This grassland is an important ecological, educational and historical resource which is being lost, albeit slowly, to invasions of brush and weeks. It appears that this is being influenced by the meadow mice on the island; areas of mouse concentrations also show heavy stands of black mustard.

Brushland:

The brushland of Brooks Island is similar to that of the mainland though not so diverse. It has spread quite rapidly in recent years, as a result of greatly improved fire control provided by the island lessee. The brushland is dominated by coyote brush, monkeyflower, poison oak, and rose. Sagebrush occurs on drier slopes, such as the scarp left by the quarrying or the southwest corner of the island. Perennial herbs, particularly figwort, mugwort, and blackberry occupy large areas of the brushland and give it a unique aspect. One plant fairly common on the island which is quite rare in the East Bay generally is lizard tail (Eriophyllum staechadifolium) which is found on rocky areas above the shoreline.

The Ponds:

The ponds at the south end of the island are artificial creations of the quarrying period. Cattails and arroyo willow have colonized the ponds and their immediate surroundings.

Trees:

Only three species of native plants on the island approach tree size, and only one of these really achieves it. The former include the arroyo willow and blue elderberry. Several buckeyes and their offspring are located on the northeast-facing slope of the island in two groups. The largest of these approaches twenty - twentyfive feet in height and a spread of up to forty feet. The absence of trees such as live oak or bay is difficult to explain; however, the presence of the buckeyes is clearly due to human influence--there is simply no other way the large heavy seeds (which are killed by contact with salt water) could get to the island. They are clustered around the Indian shellmound on the northeast shore of the island with a small group of other trees nearby. One red willow occurs in a wet spot on the northeast side of the island.

Exotics:

Brooks Island has not escaped the invasion of exotic weeds nor the introduction of cultivars. A portion of the island shoreline consists of disturbed ground. Exotic species of grasses and weedy dicots are firmly established in these areas and have spread onto virtually all parts of the island in varying numbers. Some plantings of cultivars, such as Monterey cypress, bottle brush, and oleander, have been made around the caretaker's residence.

FAUNA

Mammals:

Brooks Island contains only a minimal mammalian fauna. The resident species are all introduced; occasionally, larger mammals may swim out to the island but with increasing development at Point Richmond and Point Potrero these visits become less and less likely. The dominant mammal is the meadow mouse, or vole. This native rodent was introduced onto Bird Island in 1956 and shortly thereafter spread onto Brooks Island proper. They have largely overwhelmed the European house mouse populations. This species has been the subject of considerable study. A second non-native species, the Norway rat, persists in moderate numbers. The island lessee has conducted a poisoning campaign against the rats in recent years to cut down on depredations on the food supply for the game birds. Marine mammals occasionally are sighted around the island. These include harbor seals and, rarely, sea lions.

Birds:

Approximately one hundred species of birds are known to occur (or to have occurred) on Brooks Island. At least eighteen nest there. Perhaps the most important asset of the island for wildlife is as the refuge it is today; it serves as a resting area for birds from many surrounding areas. Several species are notable: the black-crowned night heron, which roosts in the buckeye grove on the northeast side of the island, is among them. Some fifty or so of these large birds roost on the island during the summer. The western Canadian goose has in recent years nested successfully on Brooks and Bird Islands. This is a range extension for this species, which normally nests only as far south as northwestern California. Many species are also found on the breakwater area to the west. Game species include the ring-necked pheasant (stocked by the lessee), mallard, mourning dove and California quail.

Reptiles and Amphibians:

Three species of reptiles and two (possibly three) of amphibians are known to occur on Brooks Island. These include the western garter snake (which

exhibits two color phases on the island), northern alligator lizard, and, reportedly, the pond turtle. Amphibians are represented by the arboreal salamander, slender salamander, and perhaps the Pacific tree-frog.

Fish:

Variety in the intertidal zone around Brooks Island has created favorable habitat for a number of fish species. The fish enter the intertidal zone at high tide to feed--or, as in one case, to spawn. On the rocky south and west sides of the island the more common fish include smelt and anchovy, perch, and rockfish. The midshipman enters this area to spawn. On the more sheltered and mud-bottomed northeast side, species such as staghorn sculpin, clevelandia goby, perch (three species), starry flounder, speckled sanddab, and opaleye appear. These favor benthic organisms for their diet. It also includes carnivores, including three species of shark (leopard dogfish and brown smoothhound), and other bottom-dwellers such as rays and skates. Mosquito fish have been introduced into the pond on the south end of the island.

The Intertidal Zone:

A diverse intertidal community exists around Brooks Island. Algae present include the genera Fucus, Ulva, Gracillaria, and Gigartina. These plants, together with the tidal flats, provide rich habitat for a wide variety of invertebrates. Found among these are several species of crabs, limpets, barnacles (on pilings), marine snails and bivalves, including mussels, clams and oysters. The Brooks Island area was studied in 1970 with regard to water and shellfish quality by the State Department of Public Health. A major conclusion of the study was that "with adequate safeguards and treatment of all community waste affecting this area and adequate control of boat waste discharges, harvesting shellfish for human consumption would be safe on the easterly and southwesterly shores of Brooks Island."

SUMMARY OF ANALYSIS

Protection of Natural Resources: Among the natural resources on Brooks Island are the stands of native grassland, valuable bird habitat, existing stands of buckeyes, salt marshes and general openness of the island. The resources are limited in that the island covers only forty-five acres.

Protection of Cultural Resources: The Indian sites on the island are its most valuable cultural resource. They are much more than archeological sites; they are cemeteries and regarded as holy places by Native Americans. Unfortunately they have been subjected to vandalism in the past. Concern for protection of these sites has been expressed in many quarters particularly from the Native American community.

Vegetation Management: The native grasslands on the island are slowly being lost to brush encroachment. Other plant associations are generally healthy. Several species of cultivars have been introduced onto the island around the caretaker residence.

Wildlife Management: Brooks Island is very important as a bird refuge, since there are few predators of the birds on the island. Mammals, reptiles, and amphibians are poorly represented. However, one exotic species present in some numbers is the Norway rat, which is partially dependent upon grain supplied to the game pheasants stocked on the island (a part of game management by the island's lessee).

Water Management: The island's two springs provide fresh water for wildlife and for emergencies. This supply is developed to a limited degree for domestic use. Bay water quality around the island is considered high.

Parkland Facilities: There are no recreation facilities on the island. It currently has only minimal water and sanitary facilities. The existing dock is considered unsuitable for heavy use and the bay is shallow around the island. A suitable mainland staging site has not been determined. Level land suitable for recreation totals eight acres.

SUMMARY OF GUIDELINES

Protection of Natural Resources: Preserve the unique resources of Brooks Island. Because of the island's small size, public use should be limited (generally forty or less users) and carefully controlled. Establish a regional preserve on the major portion of the island.

Protection of Cultural Resources: Protection of these sites is of the highest importance. Explore alternate means of protecting them, including maintaining a 24-hour presence on the island. The Holy Places on Brooks Island shall not be disturbed without the permission of the Native American Community Council, Richmond; Intertribal Friendship House, Oakland and the American Indian Movement (or other designated Native American group) and the East Bay Regional Park District. Any research done shall be under the direct control and supervision of these bodies.

Vegetation Management: Expand the area of native grassland in selected locations by eliminating brush. Preserve buckeye stands and salt marshes. Prevent unnatural introductions of new plant species. Eliminate cultivars or replace with "Site native" species.

Wildlife Management: Protect the value of the island as a bird refuge. Prevent unnatural introductions of new animal species. Explore alternate methods of controlling the rat population. Prohibit dogs and cats from entering Brooks Island.

Water Management: Protect springs from possible pollution. Explore means of providing sewage disposal to protect bay water quality.

Parkland Facilities: Upgrade or augment available facilities to an appropriate level. Prevent potential sewage from polluting the bay. Development should be unobtrusive and should not affect the island's ridgeline. Provide access to the island and mainland staging area if necessary.

In addition, the following three points were made supporting guidelines already recommended:

4. Use of the island should be restricted and closely supervised. (One person expressed the view that no one be allowed on the island.)

5. A permanent caretaker is necessary to protect the island from vandalism.

6. The District should take measures to preserve the native grasses and halt brush encroachment.

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